

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-29. (Canceled)

30. (Currently Amended) An apparatus for assaying effects of test formulations on barrier properties of at least one ~~test-membrane~~ piece of skin, comprising:

a first plate including[[:]]

a plurality of first wells, ~~the first wells~~ configured so that a first end of each of the first wells is sealable with the ~~test-membrane~~ at least one piece of skin, the first wells each including openings at a second end that allow a first plurality of formulations to be introduced or removed, wherein at least a portion of the first wells are arranged linearly in a row, and

a generally cylindrical plate channel that runs generally parallel to the row of the first wells positioned between the first and second ends thereof ~~adjacent to the openings thereof~~;

a generally cylindrical rod mounted in the plate channel of the first plate and extending lengthwise along a longitudinal axis, the rod including a plurality of rod channels that are generally perpendicular to the longitudinal axis, wherein each of the rod channels is configured to be in general alignment with a respective one of the first wells in the row, wherein the rod is rotatable about the longitudinal axis between an open position in which the rod channels allow the test first plurality of formulations to be introduced or removed through the openings of the first wells in the row, and a closed position in which the rod generally seals the openings of retains the first plurality of formulations in the first wells in the row to ~~retain the test formulations in the first wells~~ and promotes contact between the first plurality of formulations in the first wells and the at least one piece of skin independently of an orientation of the apparatus; and

a second plate configured for assembly with the first plate so that the ~~test-membrane~~ at least one piece of skin may be sandwiched between the first and second plates, the second plate including[[:]]

a plurality of second wells, wherein each of the second wells is in general alignment with a respective one of the first wells on an opposite side of the test membrane at least one piece of skin, each of the second wells including a first end sealable with ~~test membrane~~ at least one piece of skin and openings at a second end that allow the test a second plurality of formulations to be introduced or removed.

Claims 31-33. (Canceled)

34. (Currently Amended) The apparatus of claim 30, further comprising mechanical means for sealing the openings of the second wells after the test second plurality of formulations have been introduced or removed through the openings.

35. (Currently Amended) The apparatus of claim 34, wherein the mechanical means for sealing the second wells openings comprise at least one selected from the group consisting of: magnetic or magnetizable spheres; one or more rotating rods; one or more sealing plates; spring-loaded balls; and sealing balls affixed to plungers.

36. (Currently Amended) The apparatus of claim 30, further comprising a plurality of electrodes for measuring electrical conductance or impedance of the at least one piece of skin, wherein each of the electrodes is configured to be associated with a respective one of the first and second wells when assembled so that once the first and second wells are filled each of the electrodes contacts the test formulation in the respective one of the wells.

37. (Currently Amended) The apparatus of claim 30, further comprising a circuit wiring plate mountable to one of the first and second plates, the circuit wiring plate including a plurality of electrodes for measuring electrical conductance or impedance of the at least one piece of skin, wherein each of the electrodes is configured to be associated with a respective one of the wells when assembled so that once the first and second wells are filled each of the electrodes contacts the test formulation in the respective one of the wells.

38. (Currently Amended) The apparatus of claim 37, wherein the circuit wiring plate

comprises an array of holes through each of which the test formulations may be introduced or removed, ~~thereby providing a means of adding or abstracting samples from the wells.~~

39. (Canceled)

40. (Currently Amended) An apparatus for assaying effects of test formulations on barrier properties of at least one ~~test-membrane piece of skin~~, comprising:

a donor plate including a plurality of donor wells arranged in an array, each of the donor wells including a first end sealable with the ~~test-membrane~~ at least one piece of skin, and top openings at a second end through which ~~the test~~ a first plurality of formulations may be introduced or removed;

a receptor plate mountable to the donor plate to sandwich the ~~test-membrane~~ at least one piece of skin therebetween, the receptor plate including a plurality of receptor wells arranged in an array, each of the receptor wells including a first end sealable with the ~~test membrane~~ at least one piece of skin, and bottom openings at a second end through which the ~~test~~ a second plurality of formulations may be introduced or removed; and

a sealing device configured to seal the top and bottom openings to retain the test formulations in the donor and receptor wells and promotes contact between the formulations and the at least one piece of skin independently of an orientation of the apparatus.

41. (Currently Amended) The apparatus of claim 40, wherein the sealing device comprises a rod mounted in the receptor plate, ~~wherein the rod is configured to seal the bottom openings of at least a portion of the receptor wells.~~

42. (Currently Amended) The apparatus of claim 41, wherein the rod is movable between an open position allowing the ~~test~~ second plurality of formulations to be introduced or removed through the bottom openings and a closed position in which the rod generally seals the bottom openings ~~receptor wells~~.

43. (Currently Amended) The apparatus of claim 42, wherein the rod comprises a plurality of rod channels each alignable with a respective one of the receptor wells to allow the ~~test~~ second plurality of formulations to be introduced or removed through the bottom openings when in the open position.

44. (Previously Presented) The apparatus of claim 43, wherein the rod is rotatable between the open and closed positions.

45. (Previously Presented) The apparatus of claim 40, wherein the sealing device comprises magnetic or magnetizable balls.

46. (Previously Presented) The apparatus of claim 40, wherein the sealing device comprises at least one of: one or more sealing plates; spring-loaded balls; and sealing balls affixed to plungers.

47. (Currently Amended) The apparatus of claim 40, wherein the sealing device comprises a collapsible element and a one-way valve, whereby gas or liquid may be expelled from respective wells through the one-way valve and cause the collapsible element to correspondingly collapse so that the respective wells remain generally full of the ~~test formulation~~ formulations and without the introduction of air bubbles.

48. (Currently Amended) The apparatus of claim 40, further comprising a plurality of electrodes arranged in an array for measuring electrical conductance or impedance of the at least one piece of skin, wherein each of the electrodes is configured to be associated with a respective one of the donor wells when assembled so that once the wells are filled each of the electrodes contacts the ~~test~~ formulation in the respective one of the donor wells

49. (Currently Amended) The apparatus of claim 40, further comprising a circuit wiring plate mountable to the donor plate, the circuit wiring plate including a plurality of electrodes arranged in an array for measuring electrical conductance or impedance of the at least one piece of skin, wherein each of the electrodes is configured to be associated with a respective

one of the donor wells when assembled so that once the wells are filled each of the electrodes contacts the test formulation in the respective one of the donor wells.

50. (Currently Amended) The apparatus of claim 49, wherein the circuit wiring plate comprises an array of holes through each of which the test formulations may be introduced or removed, ~~thereby providing a means of adding or abstracting samples from the wells.~~

51. (Currently Amended) The apparatus of claim 40, wherein a one of the donor plate and the receptor plate comprises a set of elongate and generally parallel slots configured for allowing a blade to cut the ~~test-membrane~~ at least one piece of skin when sandwiched between the donor and receptor plates, each of the slots disposed generally intermediate of adjacent rows of the wells in the array of the one of the donor plate and the receptor plate.

52. (Currently Amended) The apparatus of claim 51, wherein the other of the donor plate and the receptor plate comprises a set of grooves generally arranged in mirror image fashion to the slots, so that the blade introduced through the slots can pass completely through the test ~~membrane~~ at least one piece of skin and into the grooves.

53. (Currently Amended) The apparatus of claim 40, wherein the donor and receptor plates each comprise a set of elongate and generally parallel slots configured for allowing a blade to cut the ~~test-membrane~~ at least one piece of skin when sandwiched between the donor and receptor plates, so that the blade can be introduced through the slots from either side of the ~~test-membrane~~ at least one piece of skin, each of the slots disposed generally intermediate of adjacent rows of the wells in a respective array.

54. (Currently Amended) The apparatus of claim 40, further comprising a plurality of O-rings mounted in annular grooves of the donor and receptor plates adjacent the first ends of each of the donor and receptor wells, the O-rings configured to ensure sealing at perimeters of each of the donor and receptor wells at the ~~test-membrane~~ at least one piece of skin.

55. (Canceled)

56. (Currently Amended) A method of assaying effects of a first plurality of formulations on barrier properties of at least one test-formulation on at least one test-membrane piece of skin, comprising:

assembling a donor plate and a receptor plate to sandwich the test-membrane at least piece of skin therebetween, wherein the test-membrane at least one piece of skin generally sealing seals bottom openings of a plurality of donor wells of the donor plate and generally sealing top openings of a plurality of receptor wells of the receptor plate;

introducing ~~the test-formulation~~ a second plurality of formulations to the receptor wells so that the ~~the test-formulation-contacts~~ second plurality of formulations contact the test membrane at least piece of skin from the receptor wells;

sealing bottom ~~openings of~~ the receptor wells to retain the second plurality of formulations in the receptor wells and promote contact between the second plurality of formulations and the at least one piece of skin;

inverting an orientation of the assembled donor and receptor plates; ~~and~~

introducing the ~~test-formulation~~ first plurality of formulations to the donor wells so that the ~~test-formulation-contacts~~ first plurality of formulations contact the test membrane from the donor wells;

obtaining samples from the first plurality of formulations and/or the second plurality of formulations; and

analyzing the samples to assess the effects of the first plurality of formulations on the barrier properties of the at least one piece of skin.

57. (Canceled)

58. (Currently Amended) The method of claim 56, further comprising sealing ~~top openings~~ of the donor wells to retain the first plurality of formulations in the donor wells.

59. (Currently Amended) An apparatus for assaying effects of test formulations on at least one test-membrane piece of skin, comprising:

a donor plate including a plurality of donor wells arranged in an array, each of the donor wells including a first end sealable with the ~~test-membrane~~ at least one piece of skin, and top openings at a second end through which ~~the test~~ a first plurality of formulations may be introduced or removed;

a receptor plate mountable to the donor plate to sandwich the ~~test-membrane~~ at least one piece of skin therebetween, the receptor plate including a plurality of receptor wells arranged in an array, each of the receptor wells including a first end sealable with the test membrane at least one piece of skin, and bottom openings at a second end through which the ~~test~~ a second plurality of formulations may be introduced or removed; and

mechanical means for sealing the ~~top and bottom openings~~ donor and receptor wells to retain the test formulations in the donor and receptor wells independently of an orientation of the apparatus.

60. (New) The method of claim 56, further comprising, after the assembling step and before the step of introducing the second plurality of formulations to the receptor wells, inverting an orientation of the assembled donor and receptor plates.

61. (New) An apparatus for assaying effects of test formulations on at least one test membrane, comprising:

a donor plate including a plurality of donor wells arranged in an array, each of the donor wells including a first end sealable with the test membrane, and top openings at a second end through which the test formulations may be introduced or removed;

a receptor plate mountable to the donor plate to sandwich the test membrane therebetween, the receptor plate including a plurality of receptor wells arranged in an array, each of the receptor wells including a first end sealable with the test membrane, and bottom openings at a second end through which the test formulations may be introduced or removed; and

a sealing device configured to seal the top and bottom openings to retain the test formulations in the donor and receptor wells independently of an orientation of the apparatus, wherein the sealing device comprises magnetic or magnetizable balls.

62. (New) An apparatus for assaying effects of test formulations on at least one test membrane, comprising:

a donor plate including a plurality of donor wells arranged in an array, each of the donor wells including a first end sealable with the test membrane, and top openings at a second end through which the test formulations may be introduced or removed;

a receptor plate mountable to the donor plate to sandwich the test membrane therebetween, the receptor plate including a plurality of receptor wells arranged in an array, each of the receptor wells including a first end sealable with the test membrane, and bottom openings at a second end through which the test formulations may be introduced or removed; and

a sealing device configured to seal the top and bottom openings to retain the test formulations in the donor and receptor wells independently of an orientation of the apparatus,

wherein the sealing device comprises a collapsible element and a one-way valve, whereby gas or liquid may be expelled from respective wells through the one-way valve and cause the collapsible element to correspondingly collapse so that the respective wells remain generally full of the test formulation and without the introduction of air bubbles.